

CAN/BNQ-1784-000-2021 Canadian Hydrogen Installation Code

The CAN/BNQ-1784-000 Canadian Hydrogen Installation Code was published in 2007 and is currently a “best practice document,” and not officially adopted into regulation. Technical Safety BC proposes to adopt the 2021 version of the CAN-BNQ 1784 Canadian Hydrogen Installation Code into the Gas Safety Regulation when published in December 2021, under clause 30, to demonstrate our commitment to providing clear and structured oversight of the hydrogen gas industry.

At present, Technical Safety BC oversees the safety of hydrogen storage systems, piping systems, and utilization equipment through installation permits, assessments, and operating permits, under the [Gas Safety Regulation](#).

In the last five years, there has been significant technological development within the hydrogen industry including development of hydrogen fuel cell electric vehicles, as well as significant research into hydrogen as an additive to natural gas which can significantly reduce the greenhouse gas emissions and carbon footprint of our current natural gas infrastructure. Based on this increase in demand and use of hydrogen as a transportation fuel and renewable gas, there is need for a structured oversight model for this growing sector.

Technical Safety BC plans to recommend the adoption of the 2021 edition of the CAN/BNQ-1784-000, with no variations.

Section or clause	Revision	Impact
Purpose and Scope	Revised scope for clarification of the intended application of the code, including: • The exclusion of production of, or use of, hydrogen in refineries and chemical plants as feedstock and directly in process production • The exclusion of industrial facilities at which hydrogen is produced, handled, and stored for offsite use.	Owners of refineries, chemical plants, and facilities producing hydrogen for offsite use: Clarifies that the code does not apply to these types of facilities.
Definitions	Added and revised definitions to align with other international standards and revised content throughout the code.	All code users: Aligns with other nationally recognized codes across both the gas and boiler pressure vessel technologies, and supports new content for this edition.
Clause 4	Added code content detailing the requirement for risk assessment and risk management systems for hydrogen installations. Industry standards for risk assessment require the designer to identify hazards related to technical systems and their operation and identify additional mitigation methods that will reduce risk to an acceptable level as part of the risk mitigation plan for the facility.	Designers and installers: Additional resources to develop risk assessment and management systems according to requirements. This hazard assessment and risk mitigation plan is subject to review and acceptance by the authority having jurisdiction as part of the permitting process for the facility. Provides for a higher level of safety at facilities which have a high level of interaction with the public.

Section or clause	Revision	Impact
Clause 4.3.6	Added information of fire suppression for hydrogen systems including warning notice requirements for specific fire suppression requirements for hydrogen.	Designers and installers: Must create and install warning notices for any new systems. Users and emergency personnel: Increases safety by notifying users and emergency personnel of specific fire suppression requirements of hydrogen.
Clause 5.1	Clarification of requirement for appurtenances for hydrogen systems to be certified or approved, aligning with development of nationally recognized certification standards for hydrogen equipment. Also aligns with provincial regulations.	Owners: May require certification or approval for appurtenances.
Clause 5.2	Added reference to international electrical standard IEC 61511 for electrical systems in safety or risk mitigation applications.	Designers and installers: Reference to nationally recognized standards for electrical systems in safety and risk mitigation applications provides guidance for designers and installers on minimum design criteria for these systems and alignment with other jurisdictions on requirements.
Clause 6.3	Clause 6.3 provides clarification of the intended application of requirements for emergency shutdown systems. Revisions to clause 6.3.1 through 6.3.4 revise technical requirements for emergency shut down systems, including clarification that emergency shut down circuits shall be hard wired or on a separate safety instrument system as per IEC 61511.	Designers and manufacturers: Clarification of requirements for emergency shut down requirements removes redundancy from the design and construction of hydrogen systems. Public: Improved requirements improve the safety level of complex hydrogen installations which have a high level of interaction with the public.

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Clause 7	Considerable revisions to this section were made with the intent of aligning with CSA B51, associated Canadian pressure piping codes of construction, nationally recognized hydrogen standards, and NFPA 2 to provide alignment and consistency across jurisdictions.	All code users: Alignment with other recognized codes removes conflicts across jurisdictions and provides clear models for design, construction, and oversight of hydrogen installations. Codes and standards are continually drafted and revised based on industry demand and technology advancements. Since the original publication of the Canadian Hydrogen code, a new series of hydrogen manufacturing standards has been published. The CSA B51 has been through multiple revisions to align with reference pressure piping and pressure vessel construction codes, along with development and revisions to the NFPA 2 code for Hydrogen installations in the US.